NeverMind:
Using Augmented Reality for Memorization

Oscar Rosello
2016 World Memory Championships
The Memory Palace
Concept

VR/AR HEAD MOUNTED DISPLAY TO HELP USERS VISUALIZE BOTH VISUAL CUES AND SPACE

ARCHITECTURAL SPACE IS USED AS A SCAFFOLD FOR MEMORY

A CGI VISUAL CUE HELPS NOVICES RECREATE THE VIRTUAL MEMORY PALACE

THE USER CAN DIGITALLY EXPERIENCE THE MEMORY PALACE WITH THE FULLY ENGAGED MOTOR AND PERCEPTUAL SYSTEM
Vision

We can take advantage of the connection between spatial navigation and memory to facilitate memorization.
Human Memory

sensory memory
<1 sec

short-term memory
<1 min

long-term memory
life-time

explicit memory
(conscious)
declarative

semantic
(facts)

episodic
(experiences)

implicit memory
(unconscious)
procedural
The Hippocampus
Place Cells

cell activity

overall

ongoing

behavior
Experiments
Demo
List of the 10 First Super Bowl Champions

1967 - Green Bay Packers
1968 - Green Bay Packers
1969 - New York Jets
1970 - Kansas City Chiefs
1971 - Baltimore Colts
1972 - Dallas Cowboys
1973 - Miami Dolphins
1974 - Miami Dolphins
1975 - Pittsburgh Steelers
1976 - Pittsburgh Steelers
Demo 2
We all know 3.1415...
Recall 15 digits of $\pi$
List of the 10 First Super Bowl Champions
1967 - Green Bay Packers
1968 - Green Bay Packers
   1969 - New York Jets
1970 - Kansas City Chiefs
1971 - Baltimore Colts
1972 - Dallas Cowboys
1973 - Miami Dolphins
1974 - Miami Dolphins
1975 - Pittsburgh Steelers
1976 - Pittsburgh Steelers
Experiments
Experiments
Experiments
Experiments
Experiments
Short-Term Performance

[Bar chart showing recall accuracy for 'NeverMind Average' and 'Paper Task Average'.]
The next day

- NeverMind Average
- Paper Task Average

Recall Accuracy

- 24 Hours
- 2 Minutes
Recall rate is nearly tripled

![Bar chart showing recall accuracy over different time periods](chart.png)
1. Adding input layers to the hippocampus leads to better memory recall

2. Interface improvements
Contributions

• Proposed an on-the-go memorization method by pairing spatial navigation and visual cues

• Designed an interface to make memorization enjoyable and effective

• Tested the interface on 14 subjects for long-term memory on single exposure with promising results
Nevermind
Which teams were the first 10 teams to win the Super Bowl from 1967 to 1976?
Key Insights

1. Sequences of images of places we know can be used as an effective support for memory

2. Memories encoded using the visual memory palace method are durable

3. Memory locations in the memory palace method can be reused multiple times with different content

4. Using augmented reality, subjects can use their own locations
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